B.E (EXTC) SEM VII (R) 21/05/13
Fundamental of Microwave Engineering.

AGJ 1st half (e+) 4

Con. 8891-13. **(REVISED COURSE)** **GS–5560**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining **six** questions.
(3) Use Smith chart wherever **necessary**.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) Differentiate between waveguide and transmission line. **5**
   (b) Explain amplification process in TWT. **5**
   (c) Compare klystron with magnetron. **5**
   (d) State and explain Lorentz Reciprocity theorem. **5**

2. (a) Describe the mechanism of velocity modulation in a two cavity klystron and hence obtain an expression for the bunched beam current. Also find out condition for maximum power output. **10**
   (b) Describe operation of O-type and M-type device in brief. Explain in brief Gyrotrons. **10**

3. (a) Explain the working of Magic Tee. Design a circulator using Magic Tees. **10**
   (b) Explain the procedure of measurement of dielectric constant at microwave frequency. **10**

4. (a) Describe construction and working of two hole directional coupler along with its S-matrix. **10**
   (b) Explain the working of a negative resistance parametric amplifier. **10**

5. (a) Explain single stub matching. What are its advantages and disadvantages ? **10**
   (b) Calculate the position and length of short circuited stub design to match 200+j300 load to a transmission line whose characteristics impedance is 300 Ω (use Smith chart). **10**

6. (a) Describe different modes of oscillation of Gunn diode. **10**
   (b) Explain the working of (i) Coupled line filters (ii) Filters using coupled resonators. **10**

7. Write short notes on the following :–
   (a) Measurement of impedance **5**
   (b) Hybrid junctions **5**
   (c) Show that TM_{01} and TM_{10} modes in a rectangular do not exist **5**
   (d) Microwave propagation in ferrites. **5**

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